

# The Application Research Of 5G Wi-Fi in the Medical Monitor

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**Key words:** 5G Wi-Fi; transmission rate; hospital

**Abstract:** In this paper, 5G and 4G networks were measured and compared under different distances and disturbances. It was found that the 5G Wi-Fi high-frequency communication improved the transmission rate, bandwidth and capacity of the electromagnetic wave. Ultra-dense network and large-scale use of the antenna, making the network signal enhancement, network transmission interference reduced. Therefore, the impact of 5G Wi-Fi signal in the monitor transmission rate of the main factors are the transmission signal frequency, network density and networking technology.

## Introduction

With the rapid development of mobile Internet, and the evolve and produce of long-distance education, telemedicine, remote real-time monitoring and other new mobile terminals, because of the network signal of mobile Internet exists instability, network transmission speed is slow, and network congestion, the existing network cannot meet the relevant requirements, the health care industry has to introduce more high speed, efficient and intelligent new generation wireless mobile communication technology to solve the problems in the medical industry.

## 5G Wi-Fi

The fifth generation of mobile communication network is 5G Wi-Fi, its working principle is the same as the working principle of 4G mobile Internets. It is using a variety of mobile communication technology for various mobile devices provide the necessary physical interfaces, using electromagnetic wave as the carrier of information transmission, to achieve the function of the physical layer and data link layer. But unlike the 4G, 5G, not a single wireless technology, but the existing wireless communication technology fusion [1], is more advanced than 4G performance and characteristics, advantage is relatively larger networks.

### Faster transmission speed

5G network is developed on the basis of 4G, but it USES higher frequency communication, and USES the higher frequencies, the wider bandwidth, which means that its rate is higher. So it can support more quickly to mobile phones, computers and other mobile devices transmit data, image and video.

### Bigger capacity

5G Wi-Fi the implementation of the need to establish and use more of the base station, this will increase the number of channels available, the more the more the cell is the base station, and the more cell, network the more densely populated, which makes the network signal is enhanced, so that you can support more devices to connect to the Internet at the same time at high frequencies is

used, combined with network interference cancellation technology to introduce more expanded network capacity.

### **Wider coverage**

Electromagnetic wave characteristics, therefore, within the scope of the network coverage, will happen in the process of transmission signal refraction phenomenon, this in the intangible expanded network coverage, make every corner has network coverage, almost no blind spots across the region. Users in any source to any location in this area is connected to the network.

### **The medical monitor**

Monitor is the monitoring of human vital signs, and the corresponding signs of the human body in the form of graphics, data display on the monitor display on the screen of medical equipment. It can be real-time or intermittent monitoring, and monitoring at the same time the body's life characteristics automatically stored in the CF card, so that the data can be derived when needed. In addition, it can be monitored by ECG, RESP, NIBP, SpO<sub>2</sub>, TEMP, etc. were analyzed, compared to the normal age group corresponding to the value of the population, when the monitored vital signs than normal high or low alarm, To remind the monitor, which in the medical field of the role of a great, not only in different departments to use, to monitor the role, but also invisible to reduce the corresponding burden on health care workers.

### **The application of 5G Wi-Fi in medical monitors**

Mobile communication system is to use a variety of mobile communication technology for a variety of mobile devices provide the necessary physical interface, the use of electromagnetic waves as the carrier of information transmission, to achieve the physical layer and data link layer functions. [2,3,4]Therefore, we can use the instrument to connect the wireless network, by measuring the distance and interference in different network time under the theoretical knowledge of reasoning, to identify the impact of its use in transmission rate factors.

### **Steps**

**Step 1:** choose two T5 high-end monitor configuration, label before its shell x1, x2, A PC and a router placed in high, few obstacles, the other PC and router placed in somewhere which is lower and more obstacles.

**Step 2:** Download the software for the 5G Wi-Fi card on the T5 high-end monitor labeled x1 and download the 4G Wi-Fi card software for the T5 high-end monitor labeled x2.

**Step 3:** Take electrostatic bracelet, the use of email respectively of the two T5 high-end monitor split open on the table.

**Step 4:** 5G and 4G Wi-Fi interface card Wi-Fi boards installed on the x1 and x2 respectively, reassemble monitor and check whether the instrument malfunction.

**Step 5:** If the machine does not have any problems, in a constant temperature and humidity in the range of 20 meters every 2 meters, respectively, two network measurements measured 3 times, respectively, 5G and 4G network connection time, the average, The averages are plotted as shown in Figures 1 and 2, and analyzed according to the chart.

## Data processing

**Table 1. PC and Router Measurement Results Placed at Lower Place**

Distance (m) Time(s) Monitor	0.3	2	4	6	8	10	12	14	16	18	20
x1 (1)	1.16	2.06	3.06	4.01	4.82	5.27	6.12	6.87	7.98	8.46	10.13
x2 (1)	3.06	4.56	5.44	5.96	7.74	8.12	9.87	10.81			16.46
x1 (2)	1.07	2.53	3.14	3.95	4.77	5.30	6.32	7.02	7.95	8.52	10.01
x2 (2)	3.10	4.48	5.58	6.05	7.79	8.25	9.91	10.68	12.35		
x1 (3)	1.69	2.43	3.05	3.90	4.85	5.23	6.29	7.11	8.05	8.59	9.96
x2 (3)	3.14	5.14	5.49	6.10	8.04	8.18	9.94	11.00	12.41		
$\bar{x1}$	1.31	2.34	3.08	3.95	4.81	5.27	6.24	7.00	7.99	8.52	10.03
$\bar{x2}$	3.10	4.73	5.50	6.04	7.86	8.18	9.91	10.83	12.38	#DIV /0!	16.46

**Table 2. PC and Router Measurement Results Placed at Higher Place**

Distance (m) Time(s) Monitor	0.3	2	4	6	8	10	12	14	16	18	20
x1 (1)	1.16	2.06	3.06	4.01	4.82	5.27	6.12	6.87	7.98	8.46	10.13
x2 (1)	3.06	4.56	5.44	5.96	7.74	8.12	9.87	10.81			16.46
x1 (2)	1.07	2.53	3.14	3.95	4.77	5.30	6.32	7.02	7.95	8.52	10.01
x2 (2)	3.10	4.48	5.58	6.05	7.79	8.25	9.91	10.68	12.35		
x1 (3)	1.69	2.43	3.05	3.90	4.85	5.23	6.29	7.11	8.05	8.59	9.96
x2 (3)	3.14	5.14	5.49	6.10	8.04	8.18	9.94	11.00	12.41		
$\bar{x1}$	1.31	2.34	3.08	3.95	4.81	5.27	6.24	7.00	7.99	8.52	10.03
$\bar{x2}$	3.10	4.73	5.50	6.04	7.86	8.18	9.91	10.83	12.38	#DIV /0!	16.46

## Result analysis

According to the two form data analysis can be obviously found that before 14 meters, network connection is relatively stable and the longer with the passage of distance connection; And 14 meters connect wireless network after the longer obviously, and the connection of the 4G network is very unstable, packet loss phenomenon is especially obvious. In addition, when we will place two network at the same time open, T5 often no connection we have set the network, it will connect to another network. Visible, 5G networks than 4G networks is more stable, higher rate.

## Conclusion

To sum up, the high frequency of 5G Wi-Fi communication can improve the electromagnetic wave transmission rate and improve the bandwidth, indirectly improve network rate and expand the system capacity; Super dense network and large-scale antenna using, makes the network signal enhancement and reduce network traffic interference.

## References

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